Latest Developments and Demonstration

TOT-ILC Development Priorities Discussion

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1st March 2016

ILC-TOT 3 day Meeting at CERN

chaired by Akira Yamamoto (High Energy Accelerator Research Organization (JP)), John Andrew Osborne (CERN)

from Monday, February 29, 2016 at **14:00** to Wednesday, March 2, 2016 at **18:15** (Etc/UCT)
at **CERN (Monday 54-03-030; Tuesday 61-1-017 Room D; Wednesday 40-R-A10)**

Topic Area	Issue		Solution
Review of initial Constraints	Number of turning points: 1no. turning point too limited	1.1	- Create option for user to choose a westwards and eastwards tunnel exit
	Radius of curvature: 20m should be regarded as critical limiting case condition.	1.2	- Create Case A: TOT to create a fixed 60m R' (~90°) tunnel at the 2no. turning points, given a user-defined portal location.
	Access tunnel exits LINAC eastwards only: Option of westwards exit needs to be explored	1.3	- Create Case B: TOT to create a larger curved section (R' ~ 50-100m) across the 1no. turning point.
		1.4	- Create Case C: TOT to create a non-fixed R' tunnel at the 2no. turning points, given a user-defined portal location, which crosses over the LINAC.
	Geology: Access tunnels need to avoid known disadvantageous geology e.g. carboniferous limestone	1.5	- Create ability for tunnel to avoid entering disadvantageous limestone
Updates & Fixes	PM-6 exists in TOT. This needs to be removed as not included in TDR	2.1	Noted and Removed
	Cross Section Profile. Disagreement on profile	2.2	Noted and Removed
	Number of Portals	2.3	Portal numbers are different per AH, dependent on no. of tunnels which user has chosen. This is automatically saved for next session [Further user management system needed?]
	Font colour on the screen	2.4	Option is 'greyed out' if alignment is above surface level
	How to find the portals?	2.5	User can apply hierarchy filters [Are further user filtering aids needed e.g. colours/groupings]
LINAC Configuration	Rotate LINAC about DH	3.1	- Create ability to change angle between 2no. LINACS
	Change distance between AHs	3.2	- Create ability to change distance between AHs
	FLIP/Reverse LINAC	3.3	- FLIP/Reverse LINAC
		3.4	- Create Configuration File Input TOT function
		3.5	- Create a user input within TOT
	Move/Rotate(/Flip) LINAC on the map (in the browser)	3.6	Create Drag/Drop Feature
Utilisation by Field Work	Scope To be Determined	4.1	Scope To be Determined
User Management System		5.1	
Project Management & Telecon Meetings		6.1	

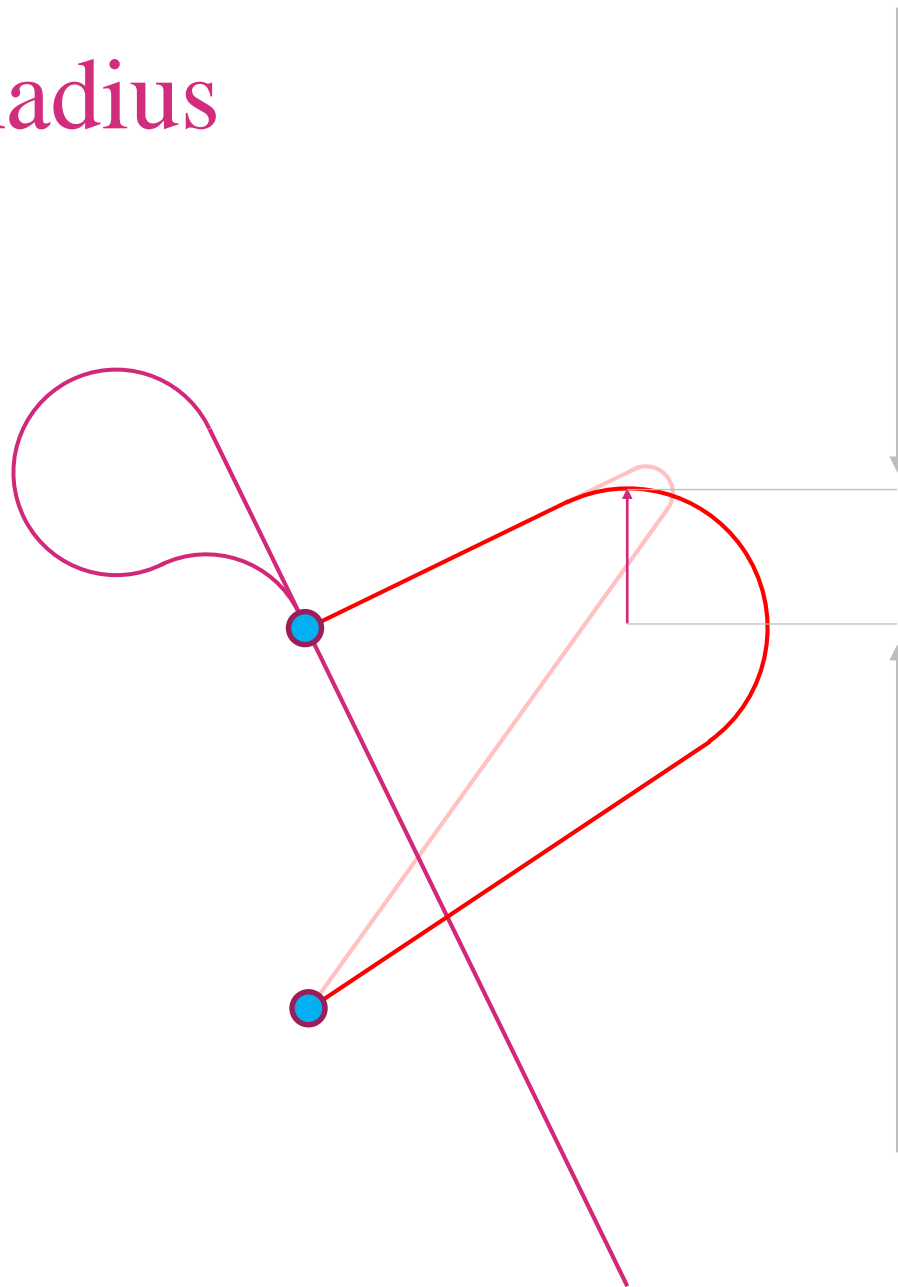# ■ Proposal : Review of Initial Constraints

Example : Case-A : 2 Turning Points, Case-B : Big Radius
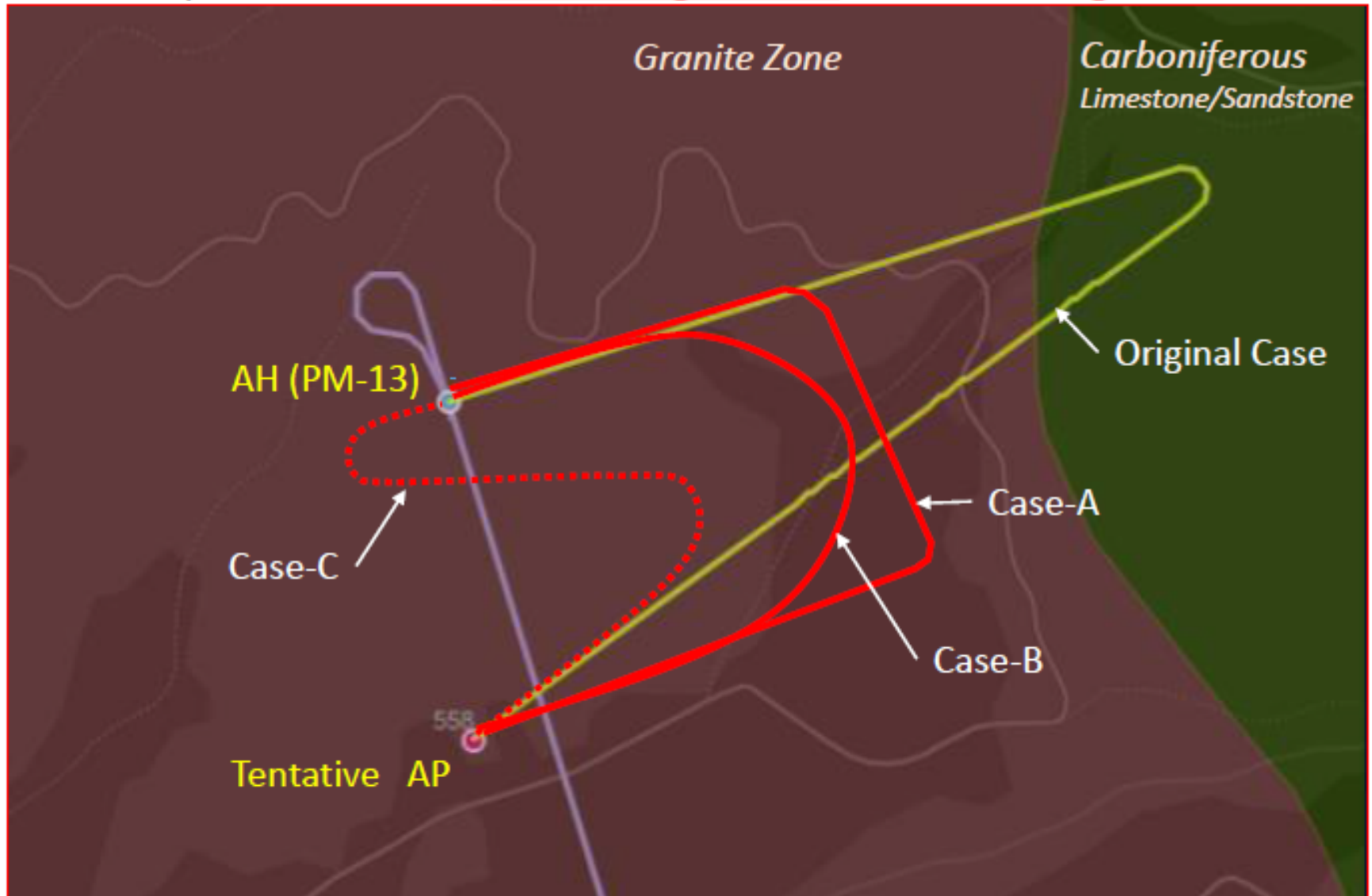
Current Situation

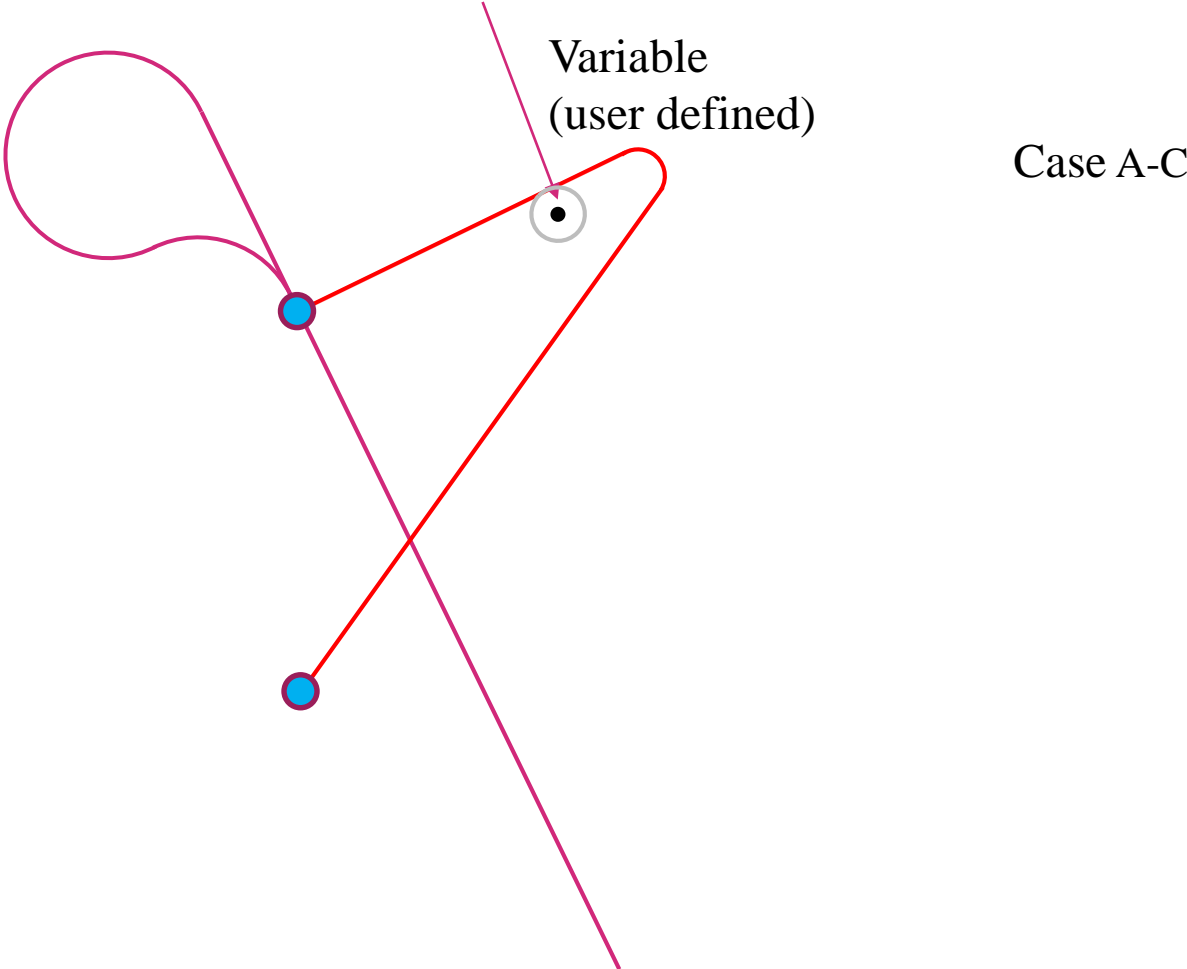Old radius = 20m
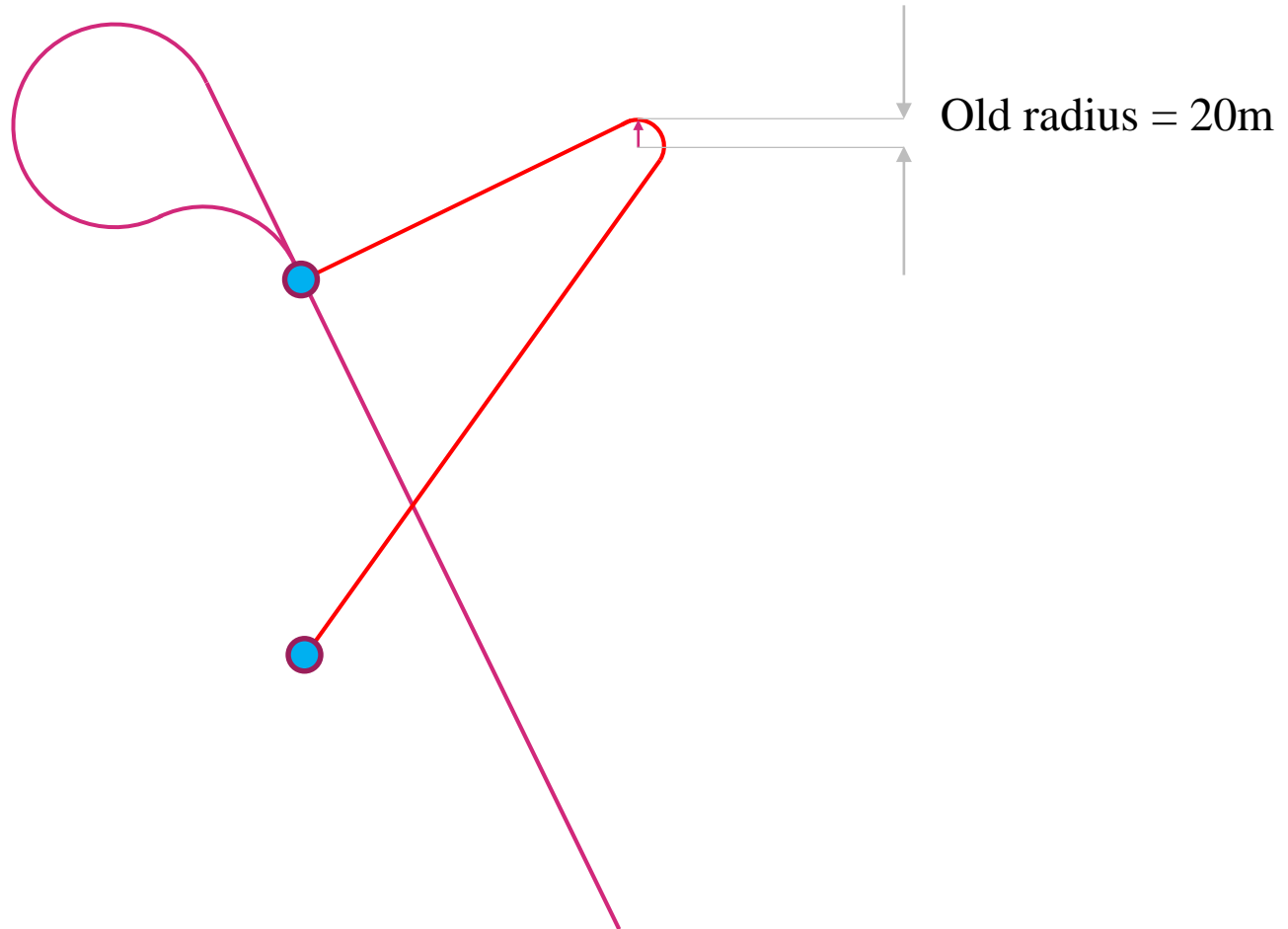
Larger Radius
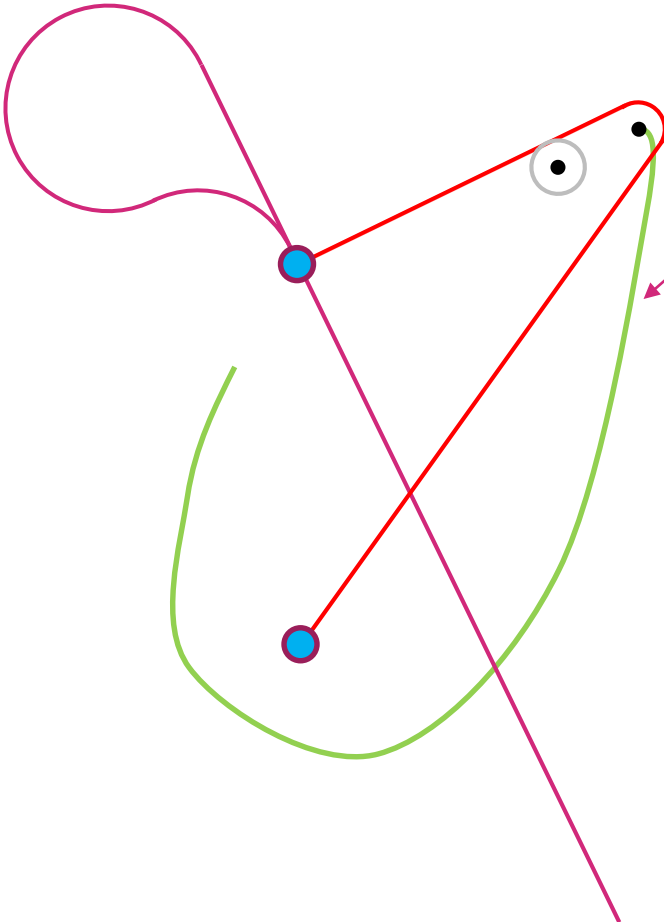
New radius = Xm

Variable
(user defined)

Identify limits of
max R'

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Second Curve

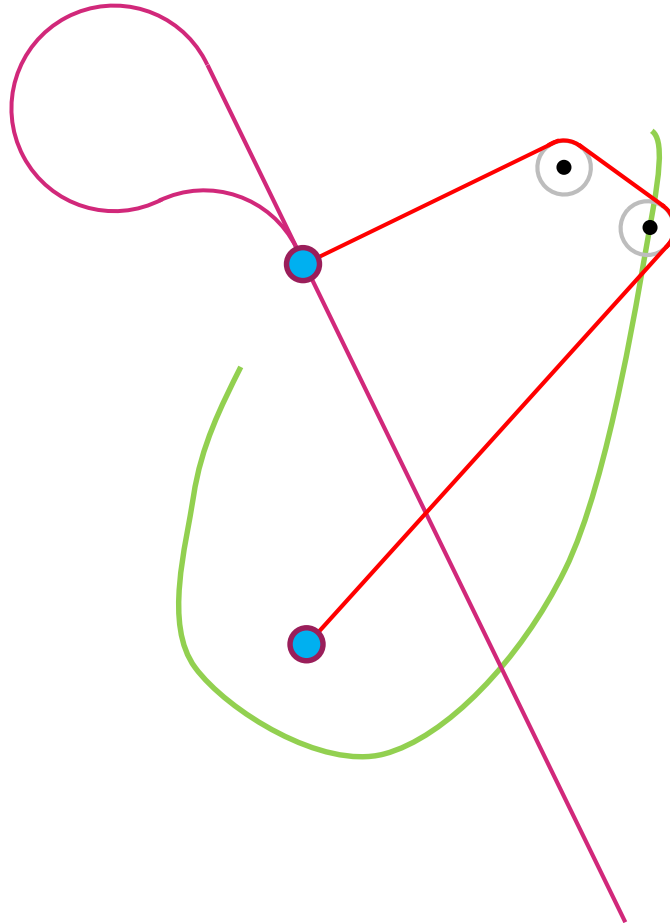Initially fix first turn position nearer than in the original case

Variable
(user defined)

Case A-C

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Second Curve

This earlier turn will be used to generate a curve that the second turn can be placed on.

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Second Curve

When the second turn is placed anywhere along this curve the length of the tunnel remains at the minimum

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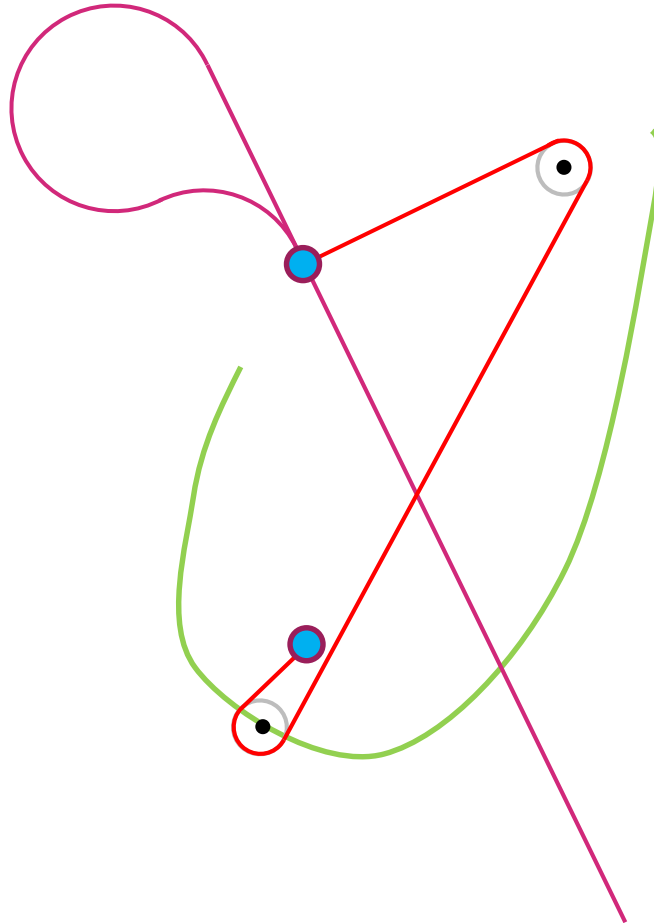
Second Curve

This generates alignments until the tunnel alignment almost crosses over itself

Second Curve
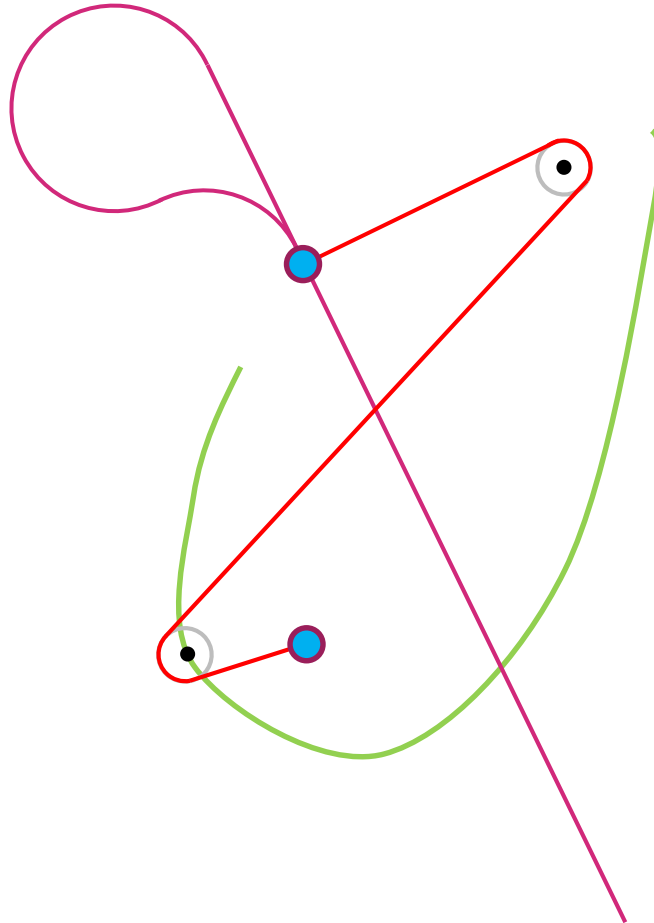
The second curve is flipped around
to get the remaining options

Second Curve - Alternative
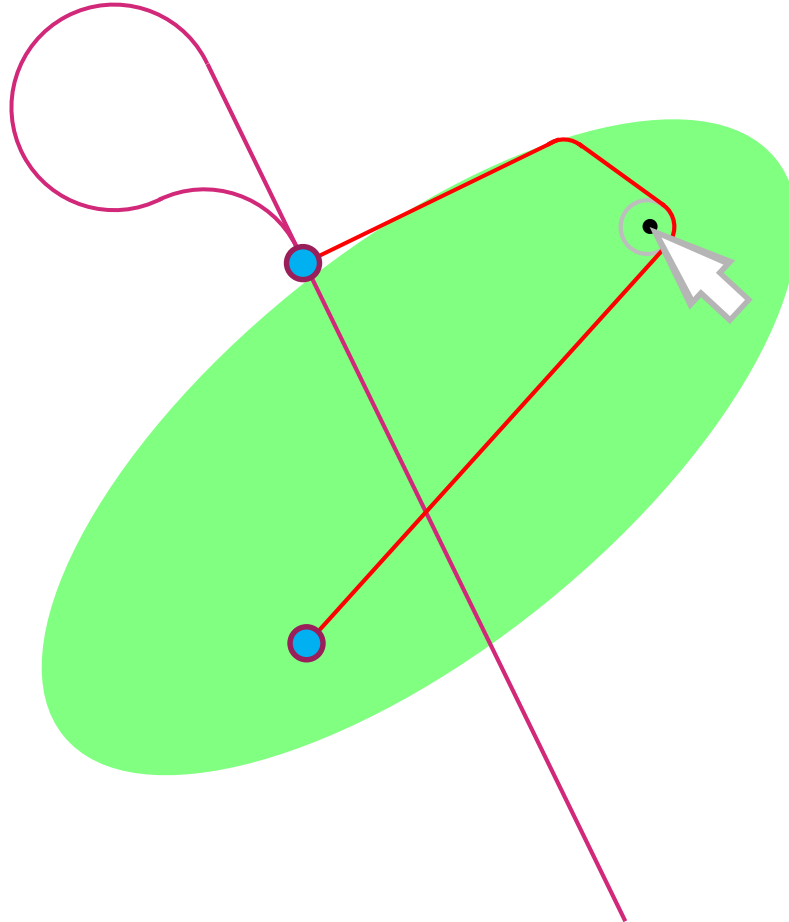
Using a similar calculation the user can choose the position of the second turn within a region.

The position of the first turn will then be calculated and placed automatically to ensure the tunnel length remains minimum.

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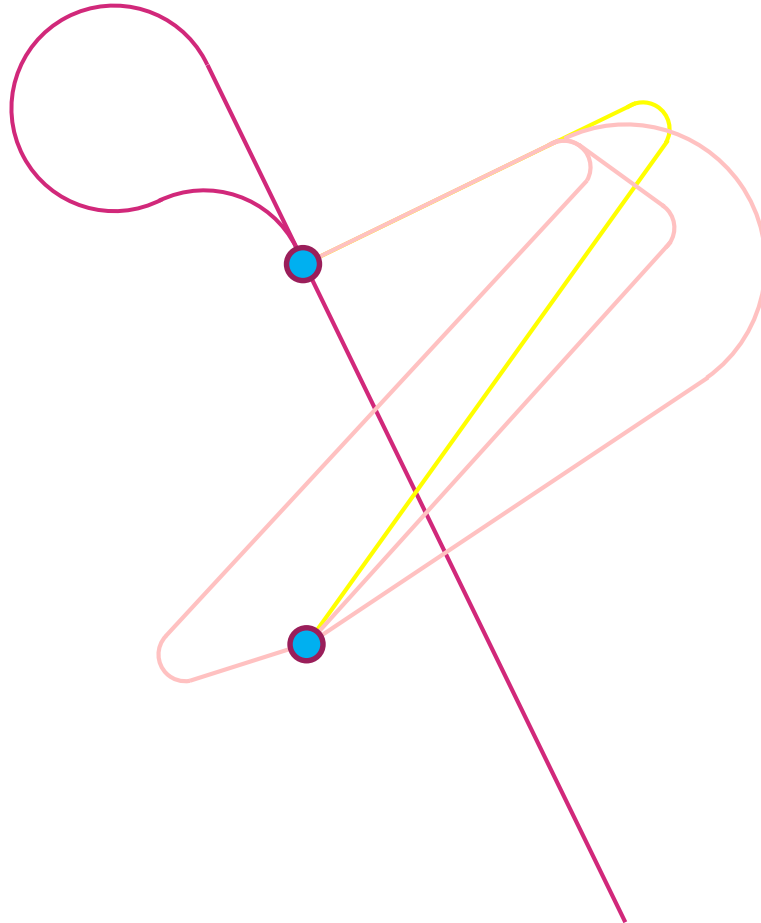
Options

A number of additional options
are possible

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ILC TOT System Administration

- User Management
  - Account administration (password changes)
  - Adding and removing user accounts
- Access Portal Management
  - Assigning 'ownership' to portals
  - Deleting portal locations
  - Ranking portal locations – identifying preferred location
- LINAC Management
  - Saving/deleting LINAC configurations
  - Assigning 'ownership' to LINAC configurations

ILC TOT System Administration

Example from FCC

ILC TOT Mobile Solution

- Requirements
  - Use ILC TOT in the field
  - Use GPS as source for portal location
- Options
  - Use laptop in field and connect to KEK network via VPN
  - Install ILC TOT application on laptop or tablet device
    - Still requires internet connection for base maps
- GPS Specifications
  - Recommend using an external GPS device connected to laptop/tablet via Bluetooth
  - External GPS has greater accuracy
  - Can take advantage of Japans GPS augmentation system which improves GPS accuracy in mountainous regions